UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,811	10/02/2003	Karl D. Sears	177079-00270	9134

7590 01/13/2006

William J. Spatz, Esq.
Kramer Levin Naftalis & Frankel LLP
919 Third Avenue
New York, NY 10022

EXAMINER	
CORDRAY, DENNIS R	

ART UNIT	PAPER NUMBER
1731	

DATE MAILED: 01/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/677,811	**Applicant(s)** SEARS ET AL.	
	Examiner Dennis Cordray	**Art Unit** 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-60* is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-60* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  Paper No(s)/Mail Date *4/27/2004*.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 13, 31 and 48 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Each claim recites a crosslinking agent comprising a C_2-C_9 polycarboxylic acid, but each claim refers to a previous claim that recites a polymeric polycarboxylic acid crosslinking agent. A C_2-C_9 polycarboxylic acid is not a polymeric polycarboxylic acid, thus Claims 13, 31 and 48 fail to further limit the referenced claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 49-53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification. Claims 49-53 recite the composition of Claim 38, comprising a bulking material, an acquisition layer, an absorbent core, a toweling material and a filter material. The meaning of the word "comprise" is 1. to be composed of, or 2. to include: contain (Webster's II New Riverside University Dictionary, The Riverside Publishing Company, 1988, p 292). The inclusion of a bulking material, an acquisition layer, an absorbent core, a toweling material or a filter material into the composition of Claim 38 is not described in the instant disclosure.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 13-19, 20, 31-37, 48 and 54-60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites a method step of "applying a polymeric carboxylic acid cross-linking agent to a sheet of cellulosic fibers, said fibers having been treated with caustic solution under non-mercerizing conditions." It is not clear if the treatment with caustic solution is intended to be a method step preceeding step (a), in which case the treatment with caustic solution should be listed separately from step (a).

Claim 20 recites a method step of "forming a wet laid sheet of cellulosic fibers, said fibers having been treated with caustic solution under non-mercerizing conditions." It is not clear if the treatment with caustic solution is intended to be a method step preceeding step (a), in which case the treatment with caustic solution should be listed separately from step (a).

Claim 54 recites "wherein said cellulosic fibers are made by wet laying cellulosic fibers in sheet form..." Making the fibers by wet laying the fibers in sheet form does not make sense. In view of Claim 38, upon which Claim 54 depends, it is assumed for the purpose of this examination that the claim refers to a wet laid sheet of cellulosic fibers made by wet laying cellulosic fibers in sheet form...

Claims 13, 31 and 48 each recite a crosslinking agent comprising a C_2-C_9 polycarboxylic acid, but each claim refers to a previous claim that recites a polymeric polycarboxylic acid crosslinking agent. It is not clear whether the intended meaning is that the polymeric polycarboxylic acid comprises C_2-C_9 polycarboxylic acid monomeric units or that that a second crosslinking agent comprising a monomeric C_2-C_9 polycarboxylic acid is applied to the sheet of cellulosic fibers.

Claims 14-19 recite properties of "the fibers" of Claim 1. It is not clear whether the properties are attributed to "fibers having been treated with caustic solution under non-mercerizing conditions" or to the cross-linked cellulosic fibers.

Claims 32-37 recite properties of "the fibers" of Claim 20. It is not clear whether the properties are attributed to "fibers having been treated with caustic solution under non-mercerizing conditions" or to the cross-linked cellulosic fibers.

Claims 55-60 recite properties of "the fibers" of Claim 38. It is not clear whether the properties are attributed to "fibers having been treated with caustic solution under non-mercerizing conditions" or to the cross-linked fibers.

For the purpose of this examination, the fibers in Claims 14-19, 32-37 and 55-60 are assumed to be the cross-linked fibers.

Examiner's Suggestion

The Examiner suggests for clarity that, on the second line of the Abstract, the words "fibers treated with a caustic solution under non-mercerizing conditions is" be changed to "fibers, which have been treated with a caustic solution under non-mercerizing conditions, is."

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 and 14-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Chatterjee (3932202).

Chatterjee discloses a method of crosslinking cellulosic fibers comprising steps of forming a wet laid sheet, applying a crosslinking agent, drying the sheet and affecting crosslinking in the dry state (col 3, lines 3-5 and col 6, lines 9-18). Chatterjee also discloses pretreating the fibers to remove much of the hemicellulose such that there is little tendency for interfiber crosslinking, thus to promote intrafiber crosslinking (col 3, lines 10-15 and col 4, lines 50-57). The pretreatment includes treating with of from 5-12% of a cold caustic solution, which range encompasses the claimed solution strengths (col 4, lines 61-68). Chatterjee further discloses examples of fibers having a hemicellulose content of 8.5 to 15.2% (col 6, Table 1). An example of a crosslinked sheet having a hemicellulose content of 8.5% and an absorbent capacity of 15.74 cc/gm (which is approximately 15.6 gm/gm when the density of the saline solution is applied) (col 7, Table 5).

Since the process is the same as the claimed process, the other absorbent properties would be inherent in the crosslinked structure.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8-13 and 20-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al (6264791) in view of Chatterjee.

Sun et al discloses a method of crosslinking comprising formation of a wet laid sheet, treating with a polymeric maleic acid crosslinking agent, drying the sheet, and curing the sheet to affect crosslinking. The crosslinking agent can be a homopolymer, copolymer or termonomer of maleic acid, which is a C_2-C_9 polycarboxylic acid (col 4, lines 40-47 and 64-66). The molecular weight of the crosslinking solution is from 500 to 5000, which significantly overlaps the claimed ranges (col 5, lines 29-31). The pH range of the solution is between 3 and 7, which significantly overlaps the claimed ranges (col 6, lines 19-22). In fact, a specific example of a crosslinking solution is disclosed, BELCLENE DP-80, which is used in many of the examples of the instant specification (col 5, lines 16-19). The fibers used in the web can be chemically treated fibers (i.e.-mercerized.or treated with caustic) (col 3, lines 56-58). The crosslinked fibers can be used for bulking material, toweling, intake layer (acquisition layer) for personal hygiene products or as absorbent pads (absorbent core) (col 12, lines 24-39).

Sun et al does not disclose fibers treated with caustic under non-mercerizing conditions. The instant disclosure teaches on pages 6 and 7 that it is well known that mercerizing conditions include low temperature (i.e.-15-35 °C) and high caustic solution strengths (i.e.-10% sodium hydroxide strength or greater). The instant disclosure also teaches on pages 8 and 9 that non-mercerizing conditions include treatment with lower than 10% sodium hydroxide and/or at temperatures greater than 35 °C.

Chatterjee discloses a method of crosslinking cellulosic fibers comprising steps of forming a wet laid sheet, applying a crosslinking agent, drying the sheet and affecting crosslinking in the dry state (col 3, lines 3-5 and col 6, lines 21). Chatterjee also discloses pretreating the fibers to remove much of the hemicellulose such that there is little tendency for interfiber crosslinking, thus to promote intrafiber crosslinking (col 3, lines 10-15 and col 4, lines 50-57). The treatment includes treating with from 5-12% of a cold caustic solution, which range encompasses the claimed solution strengths (col 4, lines 61-68). Chatterjee teaches that it is uneconomical to try to remove all of the hemicellulose unless the particular product demands it (col 5, lines 1-6). Chatterjee further discloses examples of fibers having a hemicellulose content of 8.5 to 15.2% (col 6, Table 1).

The art of Sun et al, Chatterjee and the instant invention are analogous as they pertain to the crosslinking of cellulosic fiber sheets. It would have been obvious to one of ordinary skill in the art to pretreat the fibers using a caustic solution of low concentration prior to crosslinking using the method of Sun et al in view of Chatterjee to reduce the cost of the crosslinking operation while minimizing interfiber crosslinking. It would also have been obvious to obtain the claimed absorbent properties since the fibers, crosslinking agent and crosslinking conditions are the same as those claimed.

Claims 8-13 and 20-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sears et al (6620293) in view of Chatterjee.

Sears et al discloses a method of crosslinking comprising formation of a wet laid sheet comprising mercerized cellulosic fibers, treating with a solution containing carboxylic acid crosslinking agents, drying the sheet, and curing the sheet to affect crosslinking (Abstract). The crosslinking agent can be a homopolymer, copolymer or termonomer of maleic acid, which is a C_2-C_9 polycarboxylic acid (col 4, lines 53-62). The molecular weight of the crosslinking solution is from 400 to 100000, preferably from 400 to 4000, which encompasses the claimed ranges. The pH range of the solution is between 1.5 and 5.5, preferably from 2.5 to 3.5, which is identical to the claimed ranges (col 6, lines 35-37). In fact, a specific example of a crosslinking solution is disclosed, BELCLENE DP-60, which is used in many of the examples of the instant specification (col 9, lines 4-7). The crosslinked fibers can be used for bulking material, toweling, acquisition layers or absorbent cores for personal hygiene products, diapers, etc., or as filters (col 7, lines 8-9, 20-25). A second crosslinking agent is disclosed as well as several examples of C_2 to C_9 polycarboxylic acids (col 6, lines 20-27).

Sears et al does not disclose fibers treated with caustic under non-mercerizing conditions.

As indicated in the previous rejection of the same claims, Chatterjee discloses pretreating the fibers prior to sheet formation with from 5-12% of a cold caustic solution to remove much of the hemicellulose such that there is little tendency for interfiber crosslinking. Chatterjee discloses examples of fibers having a hemicellulose content in the claimed range an absorbent capacity in the claimed range.

The art of Sears et al, Chatterjee and the instant invention are analogous as they pertain to the crosslinking of cellulosic fiber sheets. It would have been obvious to one of ordinary skill in the art to pretreat the fibers using a caustic solution of low concentration prior to crosslinking using the method of Sun et al in view of Chatterjee to reduce the cost of the crosslinking operation while minimizing interfiber crosslinking. It would also have been obvious to obtain the claimed absorbent properties since the fibers, crosslinking agent and crosslinking conditions are the same as those claimed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure [Hamajima et al (5720737), Westland et al (6184271), Westland et al (6620865), Sears et al (6620293)].

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DRC

STEVEN P. GRIFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700